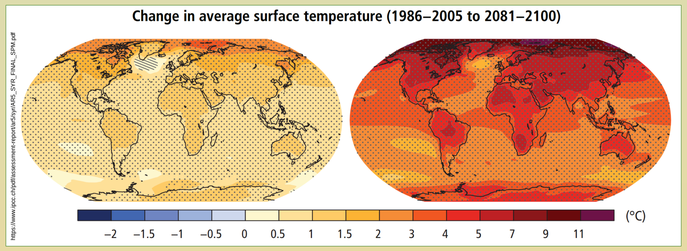
A Natural Business Idea?

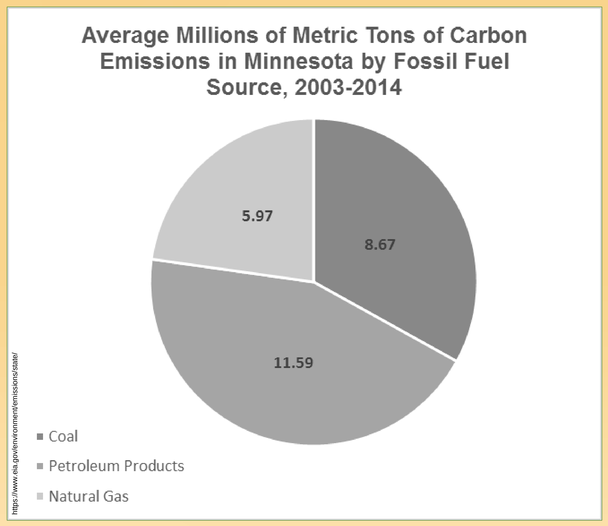
Jessica Knighton

Problem

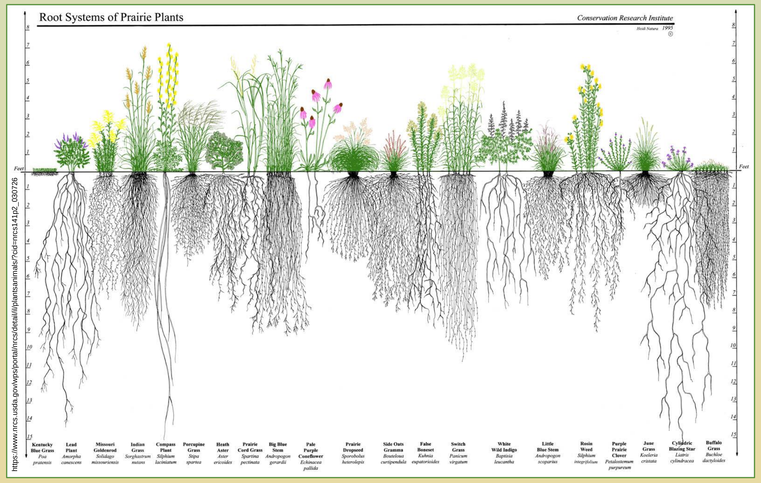
Global climate change is one of our greatest challenges today. Average global temperature has risen 1.6 degrees Celsius since the Industrial Revolution.

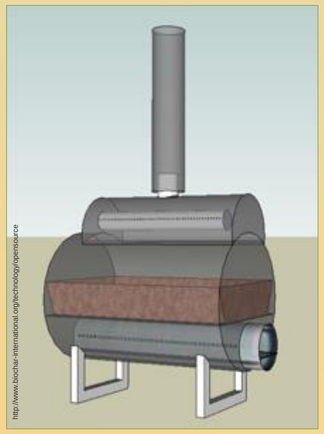


According to the US Energy Information Administration (EIA), Minnesotans releases **94.9 million metric tons of CO_2** into the atmosphere in 2014. One solution to mitigating this number is to plant low-intensity high diversity (LIHD) native Minnesota prairie grasses in unused and degraded land. Each year, the biomass can be harvested and made into bio-char, bio-oil, and syngas. Bio-char stores carbon while bio-oil and syngas are carbon-negative energy sources.

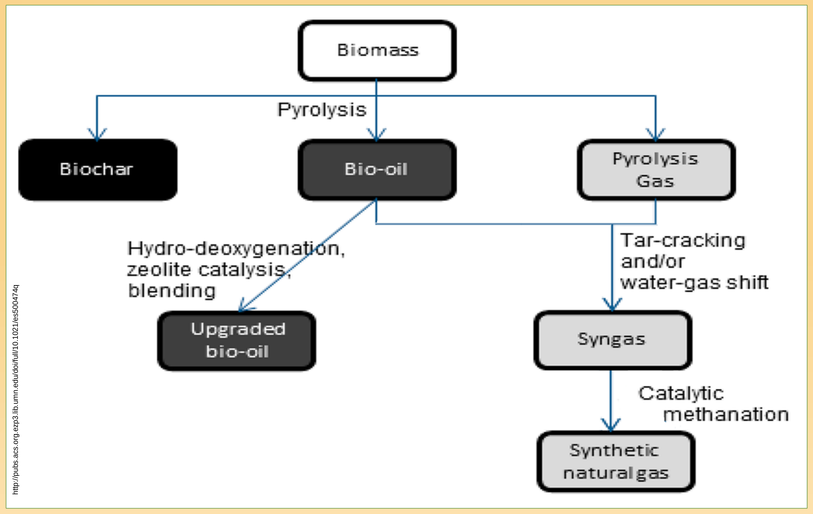


From Prairie Grass to Bio-products





Prairie grass roots store carbon at a net rate of **4.1 Mg ha^{-1} $year^{-1}$** for the first decade (Tilman). The biomass can be made into char in a kiln, with bio-oil and syngas as bio-byproducts.



As a Business

Total Potential Revenue (annual)	$308,261
Total potential expenses (annual)	$215,406
Profit Estimate (annual)	**$92,855**

Other Benefits of Bio-char

Bio-char helps with soil fertility, thus can help solve issues related to food security, and soil degradation.

References

D. Tilman, J. Hill, C. Lehman (2006). Carbon-Negative Biofuels from Low-Input High-Diversity Grassland Biomass. *Science*, 1598-1600.

D. Woolf, J. Lehmann, E. Fisher, L. Angenent (2014). Biofuels from Pyrolysis in Perspective: Trade-offs between Energy Yields and Soil-Carbon Additions. *American Chemical Society*, 6492-6499.